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12 PERSONAL AUTHOR(S) Yuen H. Lam, Mechanical Engineer					
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FIELD	GROUP	SUB-GROUP	Performance-Oriented Packaging (POP) Cartridge, M880 Mortar, 81mm 12944141 Short Range (SR) Practice		
19 ABSTRACT (Continue on reverse if necessary and identify by block number) This report details test results conducted on the Cartridge, 81mm: Practice, Short Range (SR), M880 for 81mm Mortar packaged in a wood wirebound box per drawing 12944141. The tests were conducted in accordance with the requirements of 49 CFR part 107 Subpart M (18.600 et. al.). The packaging is submitted for Performance-Oriented Packaging (POP) certification.					
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Statement A, unlimitedSECURITY CLASSIFICATION OF THIS PAGE
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I. Report Number: DOD POP HM TR/AYD 93-014

II. Title: Performance-Oriented Packaging (POP) Testing of
Cartridge, 81mm: Practice, Short Range, M880 for 81mm
Mortar Packed in a Wood Wirebound Box

Drawing Number: 12944141

Author: Yuen H. Lam

Performing Activity: U.S. Army Armament Research, Development
and Engineering Center (ARDEC)

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Date: September 1993

Distribution Statement A.

Approved for public release; distribution is unlimited.

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1. Data:

Container:

Type: Box, Wirebound
UN Code: 4C1
Specification: MIL-B-46506
Drawing Number: 12944141
Material: Wood
Maximum net mass: 31 kg (68 lbs)
Dimensions: 45.7 cm X 43.2 cm X 22.9 cm
(18 in X 17 in X 9 in)
Gross Weight: 34.5 kg (76 lbs)

Product:

Name: Cartridge, 81mm: Practice, Short Range, M880
Drawing Number: 12944202
Cage Code: 19200
United Nations Proper Shipping Name:
Cartridges for Weapons, Inert Projectile
United Nations Identification Number: 0012
United Nations Packaging Group: II
Physical State: Solid
Number of Cartridges per Container: 8
National Stock Number (NSN): 1315-01-216-7071
DOD Identification Code: C876

2. Reference Material:

- a. Federal Register, "49 CFR Part 107-179"
- b. United Nations, "Transport of Dangerous Goods"

3. Background:

This report details Performance-Oriented Packaging (POP) tests conducted on 81mm M880 Short Range Practice Cartridge for 81mm mortar packed in a wood wirebound container in accordance with drawing 12944141. Each cartridge weighs approximately 6.8 lb. A package contains 8 cartridges. The POP tests were conducted using packages containing additional weights to insure container integrity. The weight of the packed out tested container was 86 lbs (39 kg). Tests were performed according to POP test regulations.

4. Test:

The following POP tests were performed at ambient temperature:

a. Vibration Test (178.608)

Procedure:

Three wirebound boxes were vibrated on a vibrating platform unrestrained for a one-hour period. The double-amplitude (peak-to-peak displacement) was one inch and the frequency was 270 cycles per minute. The frequency was sufficient to allow the package to become completely airborne and enable a 1/16" piece of strapping material to be slid underneath the package during vibration.

Results:

After the tests, the wirebound boxes experienced no structural damage; there was no spillage of contents; the passing criteria was met.

b. Drop Test (178.603)

Procedure:

One of the packages that had been previously vibrated was reused for the five orientation drop tests: flat on the bottom, flat on the top, flat on the long side, flat on the short side, and on the corner. The height for all five drops was 4.0 ft (1.22 m).

Results:

There was no visible damage on the first four drops. On the fifth drop (on the corner), one of the long cleats on the end of wirebound box adjacent to the impact corner broke. However, no spillage occurred and the box was in a safely handled condition. In order to insure the test result to be accurate, a new wirebound box was tested. After the drop, the impact corner received only minor damage. Overall, the container was in a sound condition. All contents remained inside the container and the package was capable of being safely handled without danger of spillage. It was determined that the passing criteria was met.

c. Stacking Test (178.606)

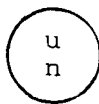
Procedure:

The second wirebound box that had been previously vibrated was reused for the stacking test. A dead load of 1,726 lbs was applied to the top of the container for a 48 hour period. This simulated a stack height of 16 ft (21 layers) of identical packages.

Results:

During the test, the container supported the load adequately. No structural damage was observed on the container after the test. The passing criteria was exceeded.

5. Based on the above POP testing, the following POP symbol has been applied to fiberboard containers in accordance with drawing 12944141.



4C1/Y39/S/**
USA/DOD/AYD

Insert the last two digits
of year packed.